

Final Approach Runway Occupancy Signal (FAROS) Operational Evaluation

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The Federal Aviation Administration (FAA) will conduct an Operational Evaluation of an experimental system intended to prevent accidents on airport runways. The Long Beach/Daugherty Field Airport (LGB) in Long Beach, CA will host the evaluation in early 2006 using the prototype FAROS system. Plans are underway to collect and analyze technical data in order to access the performance of the system, and pilots will be queried to provide data on the operational effectiveness of the system. FAROS technology notifies pilots on approach to land that the runway is occupied and/or hazardous.

Background

Currently, there is no automated capability in the National Airspace System (NAS) to directly notify airborne flight crews that a runway is occupied. Existing FAA surveillance systems depend on Air Traffic Control (ATC) to advise aircrews of potential runway conflicts at controlled airports. Uncontrolled airports have no technology or system to address this issue.

The FAA has long recognized the safety hazard of aircraft landing on an occupied runway. Loosely categorized as "landovers," this situation can lead to runway incidents of varying severity. As part of their ongoing efforts to identify means of reducing runway incursions, the FAA's Joint Safety Implementation Team (JSIT) proposed that a method be developed to directly notify pilots on approach to land that their intended runway is occupied. The Air Safety Foundation, a member of the JSIT, suggested using the glide slope indicator lights as a means of pilot notification. A prototype proof-of-concept system was installed at LGB using the Precision Approach Path Indicator (PAPI) lights and causing them to flash when the runway was occupied. This phase was successfully demonstrated to a limited set of pilots in September 2002.

Operational Concept

The FAROS concept provides a visual indication of runway occupancy status directly to pilots on approach

to land. By augmenting existing controller-pilot communications, valuable reaction time is gained and high-energy collisions may be averted in occupied runway situations.

To reduce the need for new airport equipment, pilot notification will occur by flashing an airport's existing glide slope lights. The flashing will not obscure or interfere with the normal functionality of the glide slope.

How it Works

The FAROS system monitors specific areas of the runway, called activation zones, to determine if taxiing aircraft or surface vehicles are present in the zone. These activation zones are defined at areas on the runway where ground traffic frequently exists during normal airport operations. When a vehicle is detected in a zone, the glide slope indicator lights flash to provide airborne pilots notification that the runway is occupied.

The operational evaluation at LGB will utilize inductive loop sensors embedded in Runway 30 and entrance taxiways as the surveillance source for the activation zones. The loop sensors are similar in style and function to loop sensors embedded in city roadways that detect automobile traffic. Three activation zones will be monitored, since they are the most likely to have taxiing aircraft or ground vehicles entering or crossing the runway:

- 1) The standard full-length departure position at the end of Runway 30
- 2) The common departure position at the intersection of Taxiway J and Runway 30
- 3) The intersection of Taxiway G and Runway 30.

Minor modifications were required to enable the PAPIs to flash when commanded by the system control logic. The September 2002 proof-of-concept demonstration showed that simultaneously flashing the PAPI lights did not obscure nor detract from its primary purpose as a glide slope indicator, while providing immediate and direct notification to the pilot on approach of an occupied runway.

Point of Contact

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